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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/753,332	01/09/2004	Kia Silverbrook	DAM09US	7125

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EXAMINER	
EWALD, MARIA VERONICA	
ART UNIT	PAPER NUMBER
1722	

DATE MAILED: 06/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/753,332	SILVERBROOK, KIA	
	Examiner	Art Unit	
	Maria Veronica D. Ewald	1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☒ Claim(s) *13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 13 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 23 of U.S. Patent No. 6,997,698. Although the conflicting claims are not identical, they are not patentably distinct from each other because both claim a printing system wherein the system executes a process, the system including a plurality of subsystems, each of which performs a stage of the process, each of the subsystems configured to perform one of a first subset of N1 of the stages, where N is greater than 1 and to change the stage of the subset being performed on receipt of a change instruction; wherein in the event that one of the

subsystems fails, at least one of the remaining subsystems synchronously changes to performing the respective stage of the failed subsystem without requiring transfer of data relating the respective stage to the said at least one remaining subsystems, and when a subsystem changes to performing a different stage, the system reconfigures the subsystem to be capable of performing a second subset N2 of the stages where N1 and N2 have the same number of stages, wherein the printing system includes at least two printheads, a first one of the printheads printing a first material and a second one of the printheads printing a second material, the first material being cured by a first method and the second material being cured by a second method.

Allowable Subject Matter

14. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, since prior art fails to teach a printing system wherein the system executes a process, the system including a plurality of subsystems, each of which performs a stage of the process, each of the subsystems configured to perform one of a first subset of N1 of the stages, where N is greater than 1 and to change the stage of the subset being performed on receipt of a change instruction; wherein in the event that one of the subsystems fails, at least one of the remaining subsystems synchronously changes to performing the respective stage of the failed subsystem without requiring transfer of data relating the respective stage to the said at least one remaining subsystems, and when a subsystem changes to performing a

different stage, the system reconfigures the subsystem to be capable of performing a second subset N2 of the stages where N1 and N2 have the same number of stages.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 12 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Cima, et al. (U.S. 5,869,170). Cima, et al. teach a printing system including at least two printheads, a first one of the printheads printing a first material and a second one of the printheads printing a second material (column 6, lines 60 – 65; column 12, lines 32 – 37), the first material being cured by a first method (column 9, lines 8 – 10) and the second material being cured by a second method (column 9, lines 15 – 17) and wherein the first and second methods are different (column 9, lines 1 – 5, 10 – 11, 15 – 17); wherein the first and second methods include at least one method selected from a group including: evaporative drying, freezing of material ejected when molten, ultra-violet curing addition of a curing agent (column 9, lines 1 – 5); wherein the first and

second methods includes printing of a curing agent simultaneously or sequentially with the respective material (column 8, lines 55 – 67; column 9, lines 1 – 5).

With respect to claims 4 – 6, Cima, et al. further teach wherein the first and second methods includes printing of a curing agent selected from a group including: a catalyst, polymerization initiator, a compound that reacts with the respective material (column 8, lines 55 – 67; column 9, lines 1 – 5); wherein the system is a three dimensional object creation system that prints objects layer by layer, the system printing at least part of each of the multiple layers simultaneously (column 2, lines 19 – 35; column 9, lines 5 – 17; column 12, lines 20 – 27, 30 – 40; column 13, lines 1 – 10); wherein the system includes a plurality of printheads (column 12, lines 30 – 35).

With respect to claims 7 – 10, Cima, et al. teach that wherein each layer is defined by a plurality of voxels arranged in a regular array and wherein the voxels of each layer are printed so as to be offset by half a voxel relative to the voxels of adjacent layers in a first direction, a second direction perpendicular to the first direction or both the first and section directions (column 2, lines 45 – 50, column 4, lines 17 – 20; column 6, lines 29 – 39, 55 – 60) wherein the printheads are configured to enable printing of at least two different materials in one layer (column 12, lines 32 – 37); wherein the printheads are configured such that at least one of the layers may be printed with a first set of materials and at least one of other layers may be printed with a second set of materials and wherein the first and second sets are not the same (column 10, lines 35 – 40; column 12, lines 37 – 40); wherein the system is configured to enable at least one first printhead that is initially configured to print at least part of a first layer to be

dynamically reconfigured to print at least part of a second layer (column 10, lines 35 – 40; column 12, lines 30 – 40).

With respect to claims 11 – 12 and 18, Examiner is noting that the apparatus and system of Cima, et al. is capable of executing and being configured to enable at least one first printhead that is initially configured to print at least part of a first layer to be dynamically reconfigured to print at least part of a second layer, and wherein if at least one printhead initially configured to print the second layer fails whilst printing said second layer, said at least one first printhead is dynamically reconfigured to complete the printing at least of said second layer (column 6, lines 29 – 40; column 10, lines 1 – 40); wherein the system includes semiconductor memory and wherein data defining at least one layer is stored in the semiconductor memory (column 6, lines 29 – 40); wherein the system includes at least two printheads, wherein a first printhead is actively maintained at a first temperature and a second printhead is actively maintained at a second temperature (column 10, lines 35 – 43; column 12, lines 30 – 40).

Claims 1 – 12 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Gothait (U.S. 6,658,314). Gothait teaches a printing system including at least two printheads printing a first material and a second one of the printheads printing a second material, the first material being cured by a first method and the second material being cured by a second method and wherein the first and second methods are different (column 5, lines 12 – 16, 30 – 35, 40 – 50) wherein the first and second methods include at least one method selected from a group including: evaporative drying,

freezing of material ejected when molten; ultraviolet curing; addition of a curing agent (column 5, lines 20 – 25) wherein the first and second methods includes printing of a curing agent simultaneously or sequentially with the respective material (column 5, lines 20 – 22); wherein the first and second methods includes printing of a curing agent selected from a group including: a catalyst, a polymerization initiator, a compound that reacts with the respective material (column 5, lines 20 – 22).

With respect to claims 5 – 10, Gothait further teaches that the system is a three dimensional object creation system that prints objects layer by layer, the system printing at least part of each of multiple layers simultaneously (column 5, lines 30 – 45); and wherein the system includes a plurality of printheads (column 5, lines 12 – 13); wherein each layer is defined by a plurality of voxels arranged in a regular array and wherein the voxels of each layer are printed so as to be offset by half a voxel relative to the voxels of adjacent layers in a first direction, a second direction perpendicular to the first direction or both the first and second directions (column 6, lines 15 – 30); wherein the printheads are configured to enable printing of at least two different materials in at least one layer (column 5, lines 30 – 35); wherein the printheads are configured such that at least one of the layers may be printed with a first set of materials and at least one other of the layers may be printed with a second set of materials, and wherein the first and second sets are not the same (column 5, lines 30 – 39, 45 – 55); and wherein the system is configured to enable at least one first printhead that is initially configured to print at least part of a first layer to be dynamically reconfigured to print at least part of a second layer (column 5, lines 20 – 25, 30 – 35; column 6, lines 35 – 45, 50 – 55).

With respect to claims 11 – 12 and 18, Examiner is noting that the apparatus and system of Gothait is capable of executing and being configured to enable at least one first printhead that is initially configured to print at least part of a first layer to be dynamically reconfigured to print at least part of a second layer, and wherein if at least one printhead initially configured to print the second layer fails whilst printing said second layer, said at least one first printhead is dynamically reconfigured to complete the printing at least of said second layer (column 5, lines 20 – 30; column 6, lines 20 – 30; column 7, lines 1 – 20); wherein the system includes semiconductor memory and wherein data defining at least one layer is stored in the semiconductor memory (column 5, lines 20 – 30); wherein the system includes at least two printheads, wherein a first printhead is actively maintained at a first temperature and a second printhead is actively maintained at a second temperature (column 5,lines 18 – 30).

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 14 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gothait in view of O'Connor (U.S. 5,705,117). Gothait teach the characteristics previously described but do not teach that a non-printed object can be inserted into the product.

In a method to produce components via stereolithography, O'Connor teaches that a non-photopolymer component or item can be inserted into the prototype product being manufactured. Examples of insert members include metal or ceramic members (column 2, lines 38 – 42). As in other stereolithography systems, there is a CAD design used to create the prototype (column 6, lines 24 – 25). A microprocessor is programmed to translate the CAD data to create the appropriate STL files, from which the prototype will be manufactured, layer by layer (column 6, lines 38 – 42). The prototype is partly built and then, the system is stopped, at which time the metal or ceramic insert is placed into the cavity (column 6, lines 45 – 50). This reads on the Applicant's claims that the system include at least one printhead for printing material to create a printed product, and an object incorporation device that incorporates inorganic semiconductors into the product being printed whilst the at least printhead prints the product; and wherein the system includes at least one object incorporation device that incorporates non-printed objects into the partially complete product, the non-printed objects not being printed by the system; wherein an object incorporation device that inserts at least one non-printed object into at least one cavity created during the printing process, the object incorporation device incorporating the at least one non-printed object into the at least one cavity during the printing of the respective printed object; and wherein the system includes at least one printhead that prints electrical connections to at least one object incorporated in the products.

It would have been obvious at the time of the Applicant's invention to one of ordinary skill in the art to modify the system of Gothait to incorporate the object

incorporation device of O'Connor for the purpose of inserting a ceramic or metal component into a designated cavity of the prototype, if necessary, depending on what type of prototype is being manufactured.

Response to Arguments

17. Applicant's arguments, see page 4, filed April 18, 2006, with respect to the rejection(s) of claim(s) 1 – 7, 9 and 11 under 102(b), as anticipated by Kawaguchi have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the newly-cited reference of Cima, et al. Applicant argued that Kawaguchi failed to teach the printing of a first material and a second material, each cured by a different method, respectively. Applicant further argued that Kawaguchi only teaches a single printhead, printing a releaser. Examiner agrees, and thus, has cited the reference of Cima, et al. Cima, et al. teach the production of medical devices for the controlled release of bioactive agent, using solid freeform fabrication techniques. Bioactive agent is printed onto a powder bed, such bioactive agent, dissolved in solvent, which subsequently evaporates, the bioactive agent then bound to the powder matrix and further finished by curing methods such as heating or photopolymerization (column 9, lines 1 – 5). Furthermore, in one embodiment, Cima, et al. teach that there are multiple printheads used to print solvent containing bioactive agent, another printhead prints only pure solvent. The solvent is "cured" via evaporation (column 9, lines 5 – 15), the bioactive agent, then binds with the powder, and is further cured (column 9, lines 10 – 17). Thus,

Cima, et al. teach a printing system, including at least two printheads, a first one of the printheads printing a first material (the bioactive agent/solvent solution) and a second one of the printheads printing a second material (pure solvent only), the first material being cured by a first method (evaporation of the solvent, causing the bioactive agent to bind to the powder bed, followed by subsequent curing of heating, photopolymerization or catalysis) and the second material being cured by a second method (evaporation of the solvent), wherein the first and second methods are different (the bioactive agent "cures" by evaporation of the solvent, binding to the powder bed and further curing after printing, while the solvent is "cured" via evaporation).

Applicant's arguments filed on April 18, 2006 with respect to the reference of Gothait, however, have been fully considered but they are not persuasive. Applicant has argued that Gothait does not teach the curing of a first material and a second material, such that the curing of each are different methods. Furthermore, Applicant has argued that Gothait only teaches one method – UV radiation. However, Examiner disagrees. Gothait only discloses one *type* of curing; however, the method by which UV radiation is used to cure a first and second material *can* differ. For example, Gothait teaches that the modulus of elasticity of the dispensed materials can be controlled by regulating the curing time (column 9, lines 19 – 21). Curing means includes at least first curing means for curing the first photopolymer for a first period of time and at a first radiation wavelength to obtain a first modulus of elasticity (column 3, lines 35 – 40) and a second curing means for curing the second photopolymer for a second period of time and at a second wavelength to obtain a second modulus of elasticity (column 10, lines 1 – 10).

Furthermore, Gothait teaches that adjusting the radiation wavelength and/or the time of curing, the cured interface materials will have a different modulus of elasticity. Therefore, Gothait teaches *one curing means;* however, the method by which that curing means is used to cure a first and second material differ *in that the first material is cured at one wavelength, for a period of time and the second material is cured at another wavelength, for a second, differing period of time. Thus, the methods are different.*

References of Interest

18. Danforth, et al. (U.S. 5,997,795), Akram (U.S. 6,326,698), and Schmidt (U.S. 6,841,116) are cited of interest to show the state of the art.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Veronica D. Ewald whose telephone number is 571-272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JOSEPH S. DEL SOLE
PRIMARY EXAMINER
6/20/06

MVE